## REMARKS

Applicant respectfully requests further examination and reconsideration in view of the above amendments. Claims 1-10 remain pending in the case. Claims 11-49 are cancelled herein without prejudice. Claims 1-10 are rejected. Claims 1, 5, 7 and 8 are amended herein. No new matter has been added.

## 35 U.S.C. §102(b)

Claims 1, 2, 4, 5, 7 and 8 stand rejected under 35 U.S.C. §102(b) as being anticipated by United States Patent Application Publication 2003/0068150 by Ariel et al., hereinafter referred to as the "Ariel" reference. Applicant has reviewed the cited reference and respectfully submit that the embodiments of the present invention as recited in Claims 1, 2, 4, 5, 7 and 8 are not anticipated by Ariel in view of the following rationale.

Applicant respectfully directs the Examiner to independent Claim 1 that recites that an embodiment of the present invention is directed to (emphasis added):

> An optical wave-guide absorption cell, comprising:
> a first wave-guide;
> a holey wave-guide containing a known selective absorption medium, wherein a first terminus of said holey wave-guide is coupled to a first terminus of said first wave-guide; and
> a second wave-guide, wherein a first terminus of said second wave-guide is coupled to a second terminus of said holey wave-guide.

Independent Claim 7 recites similar limitations. Claims 2, 4 and 5 that depend from independent Claim 1 and Claim 8 that depends from independent Claim 7 provide further recitations of the features of the present invention.

Ariel and the claimed invention are very different. Applicant understands Ariel to teach a method of preventing contamination of the air channel in the capillaries or pores of an air-clad or photonic-crystal fiber during polishing of the end faces. Ariel teaches that the capillaries are sealed so as to prevent contamination to the air channels of the fiber (Abstract). In particular, Applicant respectfully asserts that Ariel does not teach, describe or suggest that the air capillaries of the fiber contain "a known selective absorption medium," as claimed.

Figures 6A, 6B and 6C of Ariel illustrate steps in a method of fabricating a protected end-face of an air-clad or photonic-crystal fiber. Figure 6C shows plate 112 permanently attached to fiber 50, "thereby sealing the channels and pores of air cladding 56, and preventing humidity and other contaminants from entering" ([0071]). In particular, Ariel does not teach, describe or suggest that the channels of fiber 50 contain "a known selective absorption medium," as claimed. Ariel is silent as to the contents of the channels. Moreover, while it is possible that the channels of Ariel may contain air, Applicant respectfully asserts that air is not "a known selective absorption medium" as claimed. For instance, the absorption properties of air can vary widely based on environmental circumstances, the specific gases and substances that comprise the air, and other factors.

In contrast, embodiment of the claimed invention as recited in independent Claims 1 and 7 are directed towards an optical wave-guide absorption cell including "a holey wave-guide containing a known selective absorption medium" (emphasis added). With reference to the present specification, the optical wave-guide absorption cell is used for determining various characteristics of an optical signal, a light source and or a selective absorption medium (page 7, line 20 through page 8, line 4). In particular, the selective absorption medium is known, and thus may be used for determining these characteristics.

Therefore, Applicant respectfully asserts that nowhere does Ariel teach, disclose or suggest the claimed embodiments of the present invention as recited in independent Claims 1 and 7, that these claims overcome the rejection under 35 U.S.C. § 102(b), and are thus in a condition for allowance. Applicant respectfully submits the Ariel also does not teach or suggest the additional claimed features of the present invention as recited in Claims 2, 4 and 5 that depend from independent Claim 1 and Claim 8 that depends from independent Claim 7. Therefore, Applicant respectfully submits that Claims 2, 4, 5 and 8 also overcome the rejection under 35 U.S.C. § 102(b), and are in a condition for allowance as being dependent on an allowable base claim.

Moreover, Claims 5 and 7 recite the limitation of a "fill hole" that is an opening into the core that is not at a terminus of the holey wave-guide. Claim 8 similarly recites the limitation of an "evacuation hole" that "is an opening into said core that is not at a terminus of said holey fiber optic cable." Applicant respectfully asserts that Ariel does

not teach, describe or suggest such a limitation. In particular, Ariel does not teach, describe or suggest any opening into the fiber at all, as Ariel specifically teaches forming a protective layer at the end-face of the fiber to prevent humidity and contamination ([0071] and [0084]). Therefore, Applicant respectfully submits that Claims 5, 7 and 8 also overcome the rejection under 35 U.S.C. § 102(b), and are in a condition for allowance as Ariel does not teach, describe or suggest a fill hole or an evacuation hole that is not at a terminus of the holey wave-guide.

35 U.S.C. §103(a)

Claim 3 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ariel in view of United States Patent Application Publication 2003/0081906 by Filhaber et al., hereinafter referred to as the "Filhaber" reference. Claim 3 depends from independent Claim 1. Applicant has reviewed the cited references and respectfully submits that the embodiments of the present invention as recited in Claim 3 is not rendered unpatentable over Ariel in view of Filhaber for the following rationale.

As described above, Ariel and the claimed invention are very different. Applicant understands Ariel to teach a method of preventing contamination of the air channel in the capillaries or pores of an air-clad or photonic-crystal fiber during polishing of the end faces. In particular, Applicant respectfully asserts that Ariel does not teach, describe or suggest that the air capillaries of the fiber contain "a known selective absorption medium," as claimed. Moreover, by teaching a method for preventing contamination of the air channel, Ariel teaches away from an optical wave-guide absorption cell including

"a holey wave-guide containing a known selective absorption medium" (emphasis added), as claimed.

Moreover, the combination of Ariel and Filhaber fails to teach or suggest this claim limitation because Filhaber does not overcome the shortcomings of Ariel. Applicant understands Filhaber to teach a system and method of bonding optical components. In particular, Applicant respectfully asserts that Filhaber does not teach, describe, or suggest an optical wave-guide absorption cell including "a holey wave-guide containing a known selective absorption medium," as claimed. Therefore, Applicant respectfully asserts that Filhaber does not teach, disclose, or the claimed embodiments.

Applicant respectfully asserts that nowhere does the combination of Ariel and Filhaber teach, disclose or suggest the present invention as recited in independent Claim 1, that this claim overcomes the rejection under 35 U.S.C. § 103(a), and is thus in condition for allowance. Applicant respectfully submits the combination of Ariel and Filhaber also does not teach or suggest the additional claimed features of the embodiment of the present invention as recited in Claim 3 that depends on independent Claim 1. Therefore, Applicant respectfully submits that Claim 3 overcomes the rejection under 35 U.S.C. § 103(a), and that this claim is thus in a condition for allowance.

Claim 6 is rejected under 35 U.S.C. § 103(a) as being unpatentable over Ariel. Claim 6 depends from independent Claim 1. Applicant has reviewed the cited reference

and respectfully submits that the embodiments of the present invention as recited in Claim 6 is not rendered unpatentable over Ariel for the following rationale.

As described above, Ariel and the claimed invention are very different. Applicant understands Ariel to teach a method of preventing contamination of the air channel in the capillaries or pores of an air-clad or photonic-crystal fiber during polishing of the end faces. In particular, Applicant respectfully asserts that Ariel does not teach, describe or suggest that the air capillaries of the fiber contain "a known selective absorption medium," as claimed. Moreover, by teaching a method for preventing contamination of the air channel, Ariel teaches away from an optical wave-guide absorption cell including "a holey wave-guide containing a known selective absorption medium" (emphasis added), as claimed.

Applicant respectfully asserts that nowhere does Ariel teach, disclose or suggest the present invention as recited in independent Claim 1, that this claim overcomes the rejection under 35 U.S.C. § 103(a), and is thus in condition for allowance. Applicant respectfully submits Ariel also does not teach or suggest the additional claimed features of the embodiment of the present invention as recited in Claim 6 that depends on independent Claim 1. Therefore, Applicant respectfully submits that Claim 6 overcomes the rejection under 35 U.S.C. § 103(a), and that this claim is thus in a condition for allowance.

Claims 9 and 10 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Ariel in view of "Evanescent-wave gas sensing using microstructure fiber" by Hoo

et al., hereinafter referred to as the "Hoo" reference. Claims 9 and 10 depend from independent Claim 7. Applicant has reviewed the cited references and respectfully submits that the embodiments of the present invention as recited in Claims 9 and 10 are not rendered unpatentable over Ariel in view of Hoo for the following rationale.

As described above, Ariel and the claimed invention are very different. Applicant understands Ariel to teach a method of preventing contamination of the air channel in the capillaries or pores of an air-clad or photonic-crystal fiber during polishing of the end faces. In particular, Applicant respectfully asserts that Ariel does not teach, describe or suggest that the air capillaries of the fiber contain "a known selective absorption medium," as claimed. Moreover, by teaching a method for preventing contamination of the air channel, Ariel teaches away from an optical wave-guide absorption cell including "a holey wave-guide containing a known selective absorption medium" (emphasis added), as claimed.

Moreover, the combination of Ariel and Hoo fails to teach or suggest this claim limitation because Hoo does not overcome the shortcomings of Ariel. Applicant understands Hoo to teach evanescent-wave gas sensing using microstructure fiber. Hoo teaches that a microstructure fiber is loaded with acetylene gas using a gas chamber by placing one end of the fiber within the gas chamber (see paragraph spanning pages 8 and 9). Applicant respectfully asserts that Hoo does not teach coupling the fiber at either end to a wave-guide, as claimed. In contrast, Hoo teaches that the fiber is coupled to a 3-D translation stage and an optical power meter. Moreover, by teaching that the fiber is loaded with acetylene at the end, Hoo teaches

away from the limitation of "a fill hole formed in said core, wherein said fill hole is an opening into said core that is not at a terminus of said holey fiber optic cable, said fill hole adapted to introduce said known selective absorption medium into said plurality of voids," (emphasis added) as claimed. Therefore, Applicant respectfully asserts that Hoo does not teach, disclose, or the claimed embodiments.

Furthermore, Applicant respectfully asserts that Ariel teaches away from the combination with Hoo. As described above, Ariel teaches a method of preventing contamination of the air channel in the capillaries or pores of an air-clad or photonic-crystal fiber during polishing of the end faces by sealing off the end faces of the fiber. In contrast, Hoo teaches loading a fiber at one end with gas. Since the end of the fiber of Ariel is sealed, it would not be possible to load the fiber of Ariel with gas at the end of the fiber without rendering the fiber of Ariel inoperable for its intended purpose of preventing contamination.

Applicant respectfully asserts that nowhere does the combination of Ariel and Hoo teach, disclose or suggest the present invention as recited in independent Claim 7, that this claim overcomes the rejection under 35 U.S.C. § 103(a), and is thus in condition for allowance. Applicant respectfully submits the combination of Ariel and Hoo also does not teach or suggest the additional claimed features of the embodiment of the present invention as recited in Claims 9 and 10 that depend on independent Claim 7. Therefore, Applicant respectfully submits that Claims 9 and 10 overcome the rejection under 35 U.S.C. § 103(a), and that these claims are thus in a condition for allowance.

## CONCLUSION

In light of the above remarks, Applicant respectfully requests reconsideration of the rejected claims. Based on the arguments presented above, Applicant respectfully asserts that Claims 1-20 overcome the rejections of record and, therefore, Applicant respectfully solicits allowance of these Claims. The Examiner is invited to contact Applicant's undersigned representative if the Examiner believes such action would expedite resolution of the present Application.

Respectfully submitted,

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